

**Table 1: Notional Camera System Specifications**

	<b>Camera Type 1</b>	<b>Camera Type 2</b>	<b>Camera Type 3</b>
<b>Field of view (FOV)</b>	≥ 45 deg horiz and vert	≥110 deg horiz	175 deg
<b>Sensor Pixel Size</b>	≥ 7 μm square	4um square	≥ 7 μm square
<b>Sensor Pixel Resolution</b>	1 to 4 MPixels	1 to 2 MPixels	12 Mpixels
<b>Depth of field</b>	2m to infinity	0.8 to 2.7m working distance	10cm to 1m in focus
<b>MTF (optical resolution)</b>	> 10% contrast at image corners at max aperture, for 30 lp/mm on the image plane	> 10% contrast at image corners at max aperture, for 30 lp/mm on the image plane	0.2 at image corners, at max aperture for 30 lp/mm
<b>Distortion</b>	As close to ideal rectilinear as possible. < 0.1% geometric distortion desired	As close to ideal rectilinear as possible. < 0.1% geometric distortion desired	Fisheye, constant theta is preferred
<b>Sensor Pixel Depth</b>	≥ 14bit monochrome (16 bit preferred)	≥ 8 bit monochrome	≥ 8 bit monochrome
<b>Sensor Aspect Ratio</b>	16:9 or 3:2 preferred (4:3 or 1:1 is acceptable)	4:3 preferred	4:3 preferred
<b>Integration Time</b>	1/4000 sec to 10 sec	1/100 sec to 1 sec	1/100 sec to 1 sec
<b>Sensor Spectral Response</b>	Monochrome, peak response at 450-650 nm [6000K-7000K equivalent]	Peak response at approx. 532 nm	Peak response at approx. 532 nm
<b>Sensor Dynamic Range</b>	> 80 dB 100+ dB preferred (Note 1)	> 45dB	> 45dB
<b>Mass</b>	Overall < 0.7 kg (Note 2)	< 0.7 kg w/ lens	< 0.7 kg w/ lens
<b>Volume</b>	5x5x5 cm for the head (lens+sensor).	5x5x15 cm w/ lens	5x5x15 cm w/ lens
<b>Instantaneous FOV (IFOV)</b>	< 0.8 mrad/pixel at image center	(not specified)	(not specified)
<b>Power</b>	≤ 5W		
<b>Focal Length</b>	see FOV and sensor size		
<b>Aperture</b>	≤ f5.6, preferably with controllable iris		
<b>Format/ Size</b>	≥ 2/3" sensor		
<b>Pixel binning and sub-framing</b>	Yes		
<b>Shutter Type</b>	Electronic. Global preferred (rolling is acceptable)		
<b>Sensor Sensitivity</b>	100 - 6400 ISO equivalent		
<b>Dark Current</b>	< 1 nA/cm2 at 27° C. (< 50 pA/cm2 preferred)		
<b>Pixel Blooming</b>	Blooming mitigation desired, but not at the expense of sensitivity or dynamic range		
<b>Lens flare</b>	Lens flare mitigation is desired. Lens hood/shade, internal baffles, and coatings are acceptable.		
<b>Thermal management</b>	Yes		
<b>Radiation protection</b>	≤ 0.01% of pixels lost over the duration of the mission		
<b>Camera interface</b>	GigE, Firewire, Camera Link, SpaceWire, or USB		

Note 1: Single sensor, linear response preferred. Multi-sensor, dual amplifier, non-linear response, accumulation mode would be acceptable.

Note 2: Preferred approach would separate the lens and sensor from the rest of the electronics, with combined (lens and sensor) mass < 300g.